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Modifiable lifestyle-related prognostic factors for the onset of chronic spinal pain

A systematic review of longitudinal studies

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1. Introduction : A need for modifiable risk factors for chronic spinal pain

- Chronic back pain is **the leading cause of years lived with disability** worldwide
- A challenging task : to prevent progression to chronicity
- Historical focus on psychosocial risk factors, **Yellow flags** (Kendall 1997)
- Future prognostic tool(s) validation allowing **Stratified** and **cost-effective care** for acute spinal pain
- Clinical utility of **modifiable factors**

- Lifestyle = typical way of life or manner of living characteristic of an individual

2. Methods : Systematic Review of longitudinal studies

- Following the PRISMA recommendations for systematic reviews
- Databases : Meldine, Scopus, Pedro, Cochrane, Psycinfo, Science Direct, PTSDpubs, Google scholar
- From 01.2000 to 05.2019
- Focusing on longitudinal studies, RCT and case control
- Two reviewers independently undertook study selection
- Quality assessment and data extraction was performed by main author
- Quality assessment with the **QUIPS tool : Quality of Prognosis Studies**
- A **Qualitative meta-synthesis** was then performed



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PICO

Population	General adult population aged ≥ 18 years old, regardless of sex, free of chronic spinal pain or presenting an acute/subacute spinal pain episode
Intervention	Identification of potential modifiable lifestyle-related prognostic factor for chronic spinal pain, including neck, thoracic and/or low back pain
Comparison	Sample from the same general adult population without the factor of interest
Outcome	Neck, thoracic, low back and/or back pain episode lasting for more than three months

“We formulate the hypothesis that modifiable lifestyle related risk and protective factors play a decisive role for the onset of Chronic Spinal Pain”

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"Spine" OR "Back" OR "Neck" OR "Vertebral Column" OR spinal OR "low back" OR "lower back" OR lumbar
 AND
 "chronic pain" OR "persistent pain" OR "chronic back pain" OR "chronic low back pain" OR "chronic neck pain"
 AND
 "Prognosis" OR prognos* OR risk OR risks OR predict* OR "Risk Assessment" OR cause* OR causalit* OR causative OR "causality" OR causation OR etiology OR factor*
 AND
 "life style" OR lifestyle OR "Sedentary Behavior" OR "way of life" OR "Healthy lifestyle" OR "Activities of Daily Living" OR "Social Isolation" OR "Social Environment" OR "Social Participation" OR "Social Environment" OR "family relations" OR "family relation*" OR "Social Behavior" OR "social behavior*" OR "social relation*" OR Exercise OR exercises OR "Physical activit*" OR posture OR postures OR smoking OR tobacco OR "Substance-Related Disorders" OR "substance abuse" OR "drug abuse" OR "Substance addiction" OR "drug addiction" OR "drug dependence" OR "substance dependence" OR "sexual behavior" OR "sexual activit*" OR "sexual behavior*" OR "nutrition disorders" OR "nutritional disorder*" OR "feeding behavior" OR "eating habits" OR "eating behavior*" OR "Feeding behavior*" OR "Feeding habits" OR Fasting OR obesity OR nutrition OR diet OR Religion OR spiritualit* OR "prognostic factor*" OR religious OR faith OR belief* OR Sleep OR "sleep wake disorders" OR "sleep disorders"



- Medline
- Scopus
- Pedro
- Cochrane
- Psycinfo
- Science Direct
- PTSDpubs
- Google Scholar

Fig 1. Search equation

Grade	Definition
Strong evidence	Consistent findings in multiple low risk of bias studies with >75% of studies showing the same direction of effect
Moderate evidence	Consistent findings in multiple high risk of bias and/or one study with low risk of bias
Limited evidence	One study available
Conflicting evidence	Inconsistent findings across studies
No evidence	No association between variables

Fig 2. Meta-synthesis, definitions

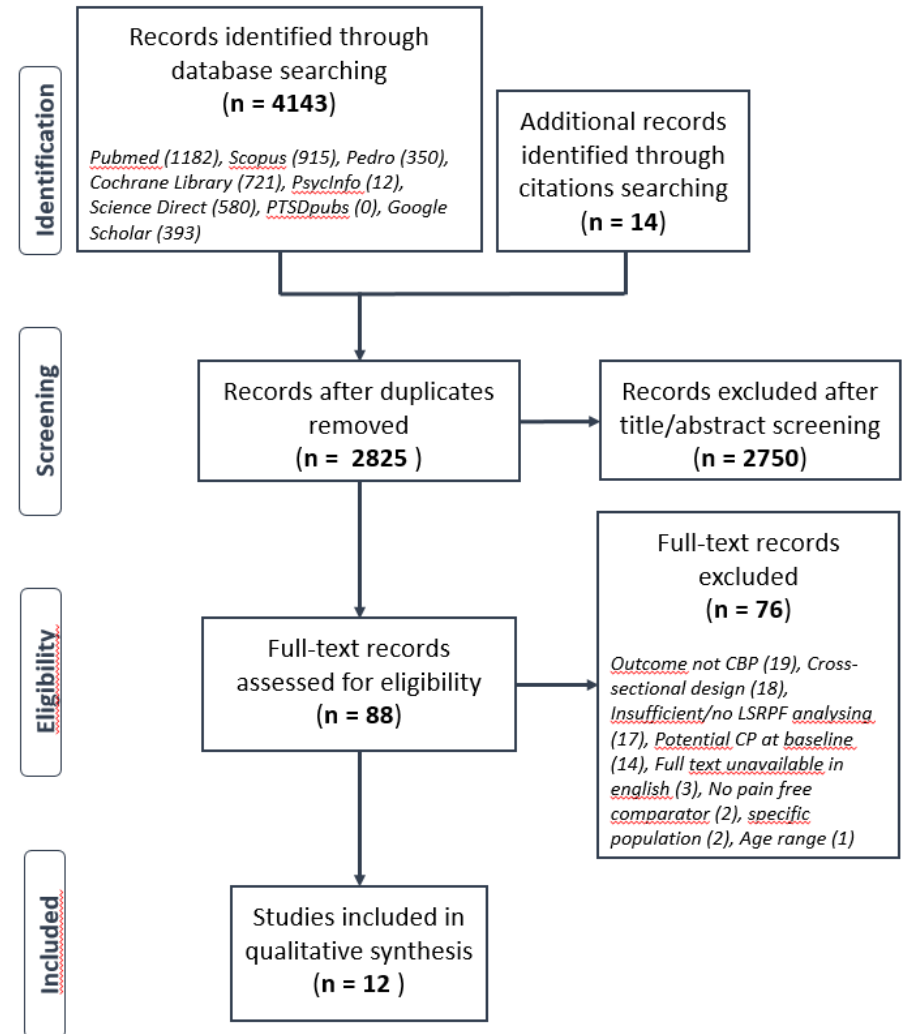


Fig 3. PRISMA Flow Diagram

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3. Results

- **12** records were selected for the qualitative assessment
- Risk of bias was low (**8** studies) to moderate (**4** studies)
- **9** studies focused on Chronic Low Back Pain occurrence, **3** on Chronic Neck Pain and **2** on Chronic Back Pain
- 562 – 77216 subjects/cohort
- Follow up ranging from 6 months to 12 years
- Several risk/protective factors emerge



Grade	Chronic Low Back Pain	Chronic Neck Pain	Chronic Back Pain
<i>Strong evidence</i>		High BMI ♀	
<i>Moderate evidence</i>	High body weight High waist circumference High Hip circumference	Sleep disorders ♀	
<i>Limited evidence</i>			More than one adult at home + Gardening/Yard work ♂+
<i>Conflicting evidence</i>	High BMI Physical activity +	High BMI ♂ Physical activity +	
<i>No evidence</i>	Smoking High Cholesterol /triglycerides Serum 25(OH)D Marital status Waist-hip ratio Drinking Gardening/Yard work +	Sleep disorder ♂ Smoking	Marital status Housing tenure Gardening/Yard work ♀ + Place of living Immigration status Drinking Physical activity + Smoking High BMI High body weight

Fig 4. Qualitative Meta-synthesis

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4. Discussion : Findings

- **High Body weight → Central adiposity** as a risk factor for chronic low back and neck pain : Inflammation vs mechanical load theory
- **Conflicting evidence** for **Leisure time physical activity as protective factor** : study limitation or possible overestimated role ?
- **Sleep disorders** : important gender differences, literature is scarce regarding this association
- **No evidence for smoking** as a risk factor, in good agreement with other studies
- Accumulation of healthy lifestyle habits may play a protective role

5. Conclusion

- Some **evidence for several modifiable lifestyle related prognostic factors**
- Evidence is scarce and effect size is low for isolated factors : **considering their association may be a better clinical strategy**
- There is a growing interest to **consider protective factors** along with risk factors in an attempt to positively encourage patients to reinforce their resources



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4. Discussion : Study Limitations

- Association between factors and chronic pain was weak, effect size was small
- Low number of selected records
- Nearly half of the records rely on the HUNT cohort
- Studies' attrition was high, which is common in epidemiological studies
- Important heterogeneity regarding variables and covariates
- Definition of chronic pain as presence of pain at the 3 months follow up is self limited, functional outcome(s) could have been included